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EFFICIENCY OF MEDICAL REHABILITATION IN ARTERIAL HYPERTENSION AS A PART OF THE SPA RESORT TREATMENT

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SUMMERY

Medical rehabilitation (MR) has become one of the important tasks of treatment in patients with arterial hypertension (AH). **The aim** – assessment of the effectiveness of spa resort MR in patients with AH under spa resort treatment (SRT) in view of the provisions of the "International Classification of Functioning, Disability and Health" (ICF).

Materials and methods. The study included 103 AH patients treated with SRT at Yalta resort. Selection of patients for the study was carried out with informed consent of patients and duration of treatment of at least 18 days. Methods of investigation and treatment were applied in accordance with the features of the functional state of the patient, the individual indications and the standards of SRT at AH. Psychological research and evaluation of quality of life (by the tests of Reeder, Beck, Spielberger-Hanin, SF-36) were additionally conducted. The analysis of the results was carried out by methods of variation statistics.

Results and its discussion. Spa resort MR in patients with AH is characterized by high efficiency. Reliable positive trends were set for a number of domains: the sensation of pain and dizziness (b280 and b2401), heart function (b410), blood pressure (b420), tolerance to physical exercises (b455) and the sensations associated with the functioning of the cardiovascular and respiratory systems (b4601).

Conclusions. Statistically significant ($p<0,05$) reduction of six domain's value by the end of the course of treatment indicates positive rehabilitation potential of SRT in patients with AH.

Key words: *medical rehabilitation, arterial hypertension, resort*

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INTRODUCTION

At the present stage of development of the health care system of Russian Federation, great attention is paid to medical rehabilitation as an important technology for strengthening population health. The Order of the Health Ministry (HM) of the Russian Federation of December 29, 2012 No. 1705n established the procedure for the organization of medical rehabilitation (MR), which provides the spa resort stage of restorative treatment for somatic diseases, including arterial hypertension (AH). However, in the normative documents of HM, in contrast to the inpatient and outpatient stages, there are no standards for spa resort MP. The solution of this problem poses the task of researching the effectiveness of a spa resort MR. At the resort of the Southern coast of the Crimea (SCC), there has been accumulated some experience of MR with AH, since 2000 the health resort "Ukraine" (later "Rodina") has a department for the rehabilitation of patients with AH integrated into complex spa resort treatment.

Modern technologies of the spa resort MP should include assessments of the vital activity and functioning of the organism in accordance with the criteria of the International Classification of Functioning, Disability and Health (ICF) and ICF CHECKLIST (Version 2.1a, Clinician Form), adopted by WHO [1, 2, 3]. Earlier results of the evaluation of the effectiveness of MP in coronary heart disease indicate the possibility of using the methodology for assessing the dynamics of the functions of patients with somatic pathology (using the medical domains of the ICF, included in ICF CHEKLIST) developed in the Sechenov Academic Research Institute [4,5].

The aim of the study was to evaluate the effectiveness of the spa resort MR in patients with AH with regard to the provisions of the ICF.

MATERIALS AND METHODS

The study included 103 patients with AH (stage I-II) who underwent MR in the resort of Yalta. Research and treatment were carried out with respect for the rights and freedoms of patients, which are stipulated in the Helsinki Declaration, and the requirements set out in the standards for spa treatment and in clinical protocols, with the obligatory informed consent of patients for the examination and treatment. Selection of patients for the study was carried out by the method of continuous sampling with a treatment duration of at least 18 days. There were 53 women and 50 men in the group, the average age of the patients was 53.3±0.9 years, the 1st stage of AH have 14 people, the second stage - 23 people, the average duration of the disease was 8.3±0.6 years.

Methods of treatment were applied in accordance with the peculiarities of the functional state of patients, individual indications and the standard of spa resort care to patients with diseases characterized by high blood pressure (Order of the Ministry of Health and Social Development of the Russian Federation of 22 November 2004 No. 222). Therapeutic procedures were carried out in accordance with the current methodological recommendations. Drug therapy with antihypertensive and other medicines shown in combination with the use of non-medicine therapeutic factors was carried out in accordance with approved clinical protocols, forms and methodological recommendations.

The average duration of MR was 20.5±0.2 days. The composition of complex spa resort treatment and MR (average per cent coverage and average number of procedures for treatment) was as follows: air baths (87.3% and 18.2±0.7 procedures); solar baths (35.9% and 17.6±1.5); bathing in sea water, incl. in the basin (95.1% and 16.1±0.6); hydrotherapy, incl. therapeutic baths and showers (28.2% and 8.1±0.4); electrotherapy, incl. electrophoresis, galvanization, sinusoidal-modulated and diadynamic currents (5.8% and 8.2±0.2); light therapy, incl. SUV, sollux and laser (1.0% and 6.0±0.1); other types of physiotherapy, incl. UHF, inductothermy, magnetotherapy and ultrasound therapy (7.8% and 8.5±0.2); inhalation of medicines, aeroionotherapy, speleotherapy and other types of aerotherapy (29.1% and 11.6±0.6); aroma-phytotherapy (45.6% and 20.2±1.3); therapeutic physical culture, incl. therapeutic gymnastics, physical training on simulators and terrenkur rout (88.4% and 13.6±0.7); classical massage (93,1% and 9,6±0,3); basic pharmacotherapy, incl. ATE inhibitors, β-blockers, calcium antagonists, α-adrenoblockers, angiotensin II receptor blockers, diuretics, antiaggregants, anticoagulants, statins, and other drugs (76.7% and 34.5±2.5 daily doses of all pharmaceuticals for the course of treatment).

Methods of the diagnostic examination were applied in accordance with the peculiarities of the functional state of patients, individual indications and the standard of spa resort treatment in AH (Order of the Ministry of Health and Social Development of the Russian Federation of 22 November 2004 No. 222). In addition, psychological research and assessment of the quality of life were conducted (tests of Reeder, Beck, Spielberger-Hanin, SF-36). The evaluation of the domain values of the functions included in the ICF was carried out in accordance with the methodology developed at the Sechenov Academic Research Institute [4]. The evaluation used the results of monitoring of 25 parameters, each parameter was measured before and after the course of spa resort treatment.

Mathematical analysis of the research results was carried out using variation statistics methods. The difference in the mean values of the monitored parameters by the Student's test was estimated. In addition to assessing the average values of the parameters of the monitored functions, their dynamics was also evaluated: parameter dynamics = (parameter value at the beginning of the course of treatment) - (parameter value after the course of treatment). The effect of the rehabilitation effects on the controlled functions was judged by the presence of significant differences in the mean values of the parameters and their dynamics (at $p<0.05$).

RESULTS AND DISCUSSION

The statistical nature of the distribution of the data obtained was close to normal in all controlled domains. Under the influence of the treatment, the patients' well-being improved, the manifestations of the main symptoms of the disease decreased. The overall efficacy of the treatment was positive: a significant improvement was seen in 3 patients (2.9%), improvement in 87 (85.3%), unchanged in 12 (11.8%), no worsening.

Evaluation of the effectiveness of MR with respect to ICF domains is shown in Table 1. As can be seen from the presented data, the spa resort MR in patients with AH was characterized by rather high efficiency.

The sensations of pain (domain b280), dizziness (domain b2401), and sensations associated with the functioning of the cardiovascular and respiratory systems (domain b4601) are some of the most unpleasant effects of the disease and significantly affect the patient's quality of life, their positive dynamics are important indicators of the success of a spa resort MR.

Violation of blood pressure regulation (domain b420) is the main pathogenic characteristics of AH and the most common cause

Table 1. Changes in the functional status of patients with AH as a result of spa resort MR

ICF domain codes, their identifiers and units of measure (points #)		Mean values (M) and standard errors of mean values (± m),		
Para-meter Nos.	Controlled parameters that form domains, and units of their measurement	at the beginning of the course	after the course	dynamics
1	2	3	4	5
b2401 "Dizziness " (points), incl.		0.689 ±0.069	0.010 ±0.010	+0.680 * ±0.068
1	complaints of dizziness (points)	0.689 ±0.069	0.010 ±0.010	+0.680 * ±0.068
b280 " Sensation of pain" (points), incl.		1.189 ±0.053	0.087 ±0.020	+1.102 * ±0.052
2	complaints of pain in the heart (points)	1.019 ±0.078	0.029 ±0.017	+0.990 * ±0.076
3	complaints of a headache (points)	1.359 ±0.067	0.146 ±0.035	+1.214 * ±0.061
b410 "Heart functions " (points), incl.		0.450 ±0.049	0.324 ±0.036	+0.126 * ±0.029
4	heart rate - HR (beats / min)	70.092 ±1.063	69.255 ±0.918	+0.837 ±0.787
5	insufficiency of coronary blood flow, blood supply to the heart, functional class - FC (points)	1.683 ±0.101	1.679 ±0.102	+0.004 ±0.004
b420 "Blood pressure functions" (points), incl.		2.010 ±0.108	0.806 ±0.080	+1.204 * ±0.086
6	systolic blood pressure - SBP (mmHg)	149.117 ±2.074	128.311 ±1.145	+20.806 * ±1.635
7	diastolic blood pressure - DBP (mmHg)	90.272 ±1.182	80.291 ±0.710	+9.981 * ±0.956
8	pulse arterial blood pressure - PBP (mmHg)	58.845 ±1.632	48.019 ±0.991	+10.825 * ±1.377
b430 " Haematological system functions " (points), incl.		0.499 ±0.052	0.552 ±0.052	-0.053 ±0.048
b4301 "Oxygen-carrying functions of the blood" (points), incl.		0.227 ±0.040	0.246 ±0.041	-0.019 ±0.040
9	the number of erythrocytes in the blood - EC (10^{12} / l)	4.147 ±0.055	4.268 ±0.053	-0.121 ±0.055
10	the content of hemoglobin in the blood - Hb (g / l)	132.631 ±1.383	131.214 ±1.281	+1.417 ±1.003
11	color index of blood - CI (arbitrary units)	0.968 ±0.009	0.930 ±0.009	+0.038 * ±0.009
b4303 "Clotting functions" (points), incl.		0.831 ±0.101	0.931 ±0.093	-0.076 ±0.084
12	prothrombin index - PI (%)	87.581 ±1.201	85.322 ±1.023	+1.211 ±1.275
b440 "Respiration functions" (points), incl.		1.517 ±0.121	1.268 ±0.131	+0.049 ±0.117
13	the volume of vital capacity of the lungs - VC (% of the required values)	63.266 ±1.882	67.718 ±2.076	-4.530 ±1.557
b455 "Exercise tolerance functions" (points), incl.		2,332 ±0,056	1,563 ±0,060	+0,769 * ±0,046
b4550 "General physical endurance" (points), incl.		1,857 ±0,143	2,071 ±0,195	-0,214 ±0,114
14	6-minute walk test - 6MWT (m)	387.00 ±21.768	375.571 ±23.840	+11.929 ±4.937
b4551 "Aerobic capacity" (points), incl.		3.392 ±0.090	3.030 ±0.116	+0.356 * ±0.065
15	test for duration of breath holding at exhalation – BHE (sec)	22.020 ±0.659	25.030 ±0.681	-2.941 * ±0.307
b4552 "Fatigability" (points), incl.		1.340 ±0.063	0.087 ±0.028	+1.252 * ±0.061
16	complaints of fatigue (points)	1.340 ±0.063	0.087 ±0.028	+1.252 * ±0.061
b4601 "Sensations associated with cardiovascular and respiratory functions" (points), incl.		0.660 ±0.054	0.081 ±0.025	+0.579 * ±0.048
17	complaints about interruptions in the work of the heart (points)	0.262 ±0.063	0.029 ±0.017	+0.233 * ±0.060
18	complaints about palpitation (points)	0.913 ±0.074	0.068 ±0.028	+0.845 * ±0.071
19	complaints about shortness of breath (points)	0.282 ±0.059	0.039 ±0.024	0.243 * ±0.052
20	lack of air, shortness of breath (points)	0.786 ±0.081	0.136 ±0.039	+0.650 * ±0.070
b530 "Weight maintenance functions" (points), incl.		1.534 ±0.098	1.485 ±0.096	+0.049 ±0.025
21	height-weight index, the Quetelet index, body mass index - BMI (kg / cm^2)	29.654 ±0.512	29.296 ±0.569	+0.358 ±0.236
b540 "General metabolic functions" (points), incl.		1.104 ±0.104	1.024 ±0.091	+0.080 ±0.048
b5403 "Fat metabolism" (points), incl.		1.224 ±0.112	1.230 ±0.101	-0.006 ±0.072
22	cholesterol (mmol/l)	5.698 ±0.128	5.692 ±0.108	+0.006 ±0.070
23	triacylglycerol (mmol/l)	2.188 ±0.132	2.185 ±0.100	+0.003 ±0.077
b5408 "General metabolic functions, other specified" (points), incl.		1.068 ±0.149	0.903 ±0.130	+0.165 ±0.068
24	metabolic syndrome (points)	1.068 ±0.149	0.903 ±0.130	+0.165 ±0.068
d240 "Handling stress and other physiological demands" (points), incl.		2.141 ±0.073	2.074 ±0.085	+0.136 ±0.043
25	the level of psychological stress, the modified Reeder test - RT (points)	2.141 ±0.073	2.074 ±0.085	+0.136 ±0.043
Average value of all domains (points)		1.344 ±0.037	0.873 ±0.031	+0.472 * ±0.018

Note: *# points: 0 – no problem (no, none, negligible); 1 – mild problems (minor, weak); 2 – moderate problems (average, significant); 3 – severe problems (high, intense); 4 – absolute problems (complete); * - dynamics, i.e. the difference in mean values at the beginning and at the end of the course of treatment, is statistically significant, with $p<0.05$.*

of pain (headache, heartache), accompanied by hemodynamic overload of the myocardium, and significantly reduces the patient's adaptive capacity leading to a decrease in physical exercise tolerance and performance.

The positive dynamics of blood arterial blood pressure is the pathogenic key result of MR in patients with AH, providing a reduction in the dysfunction of the domain b410 "Heart functions" and, more importantly, of domain b455 "Exercise tolerance functions". Reduction of function disorders in this domain is due to a significant decrease in the domains b4551 "Aerobic capacity" and b4552 "Fatigability", which significantly improves the performance and social activity of patients.

A decrease in the average value of all controlled domains by the end of the course of treatment indicates a high effectiveness of the integrated spa resort MR in patients and of the adequacy of the application of the standard for spa resort care to patients with diseases characterized by high blood pressure to solve the problems of the spa resort MR in patients with AH.

CONCLUSION

The values of the domains of functions included in the ICF relatively decreasing by the end of the course of spa resort treatment indicate a positive rehabilitation prognosis (in relation to these functions) and a rather pronounced positive rehabilitation potential of the complex of methods of spa resort treatment in patients with AH.

The obtained data testify to the validity of the indications for the spa resort MR in patients with AH at the resort of the Southern coast of Crimea and to the possibility of successfully applying the standard for spa resort care to patients with diseases characterized by high blood pressure (Order of the Ministry of Health and Social Development of November 22, 2004 № 222) for solving the problems of the spa resort MR in patients with AH.

Implementation of a rehabilitation prognosis for individual functions can be used as a target parameter under formation of spa resort MP programs for patients with AH.

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